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THE COAL SEAMS OF JACKSON COUNTY.

BY ANDREW ROY.

The coal bearing strata of Jackson County, belong to the lower coal measures of the State. In the western part of the county the conglomerate and underlying Cuyahoga shale come to the surface; while in the eastern townships the coal rocks attain a thickness of 600 to 700 feet and hold seven beds of coal of workable thickness, in addition to more than this number of other seams regarded as too thin for the immediate practical purposes of the miner. The lower coal measures counting from the lowermost or shaft coal of Jackson to the uppermost or Lucas coal, the equivalent of No. 7 of the State Geological reports are fully 500 feet in thickness. No other section of the State contains an equal thickness of lower coal bearing strata.

The lowermost coal, as I have said is the Jackson shaft coal which has been mined and used in the blast furnaces of the county in a raw state for fully thirty years. This vein ranges from three to four feet in thickness and is met in swamps and hills similar to the swamps and hills met in the mines of the Mahoning and Tuscarawas Valleys. It no doubt represents the geological equivalent of the block coal of the Youngstown field and the lowermost coal in the Massillon district.

The Wellston coal, which is the second seam in the Jackson region, of minable thickness in ascending order, is, like the Jackson coal, a dry-burning seam, and is used in the blast furnaces of Wellston as it comes from the miners pick. This coal first attracted public attention during the progress of the late geological survey and on the completion of two roads to the coal field thirteen years ago, now known as the Ohio Southern and the Dayton & Wellston branch of the C. H. & D. system. Developments were made with great activity. The output of the mines from this seam now considerably exceed a million tons. This coal is remarkably steady along its line of direction, horse backs or other mining faults being rarely met, but the basin is of limited area, and the coal seems to have no equivalent in any other region of the State in course of development except the Elko mines in Vinton County.

The Wellston basin is a peculiar formation. At Wellston it is little more than two miles in width, but it widens rapidly in its

western extension. On the north as also on the south sides of the basin the coal gradually runs into shale. This coal bed seems to have been formed in an undulating marsh for there are hills in the mines 30 feet high; on the edges of the deposit the coal does not rise and thin out to a feather edge or abruptly disappear by a want fault as in the mines of the Mahoning and Tuscarawas fields but runs level, the coal becoming more slaty with each yard of advancement until it becomes a mass of shale altogether. Westward on the line of rise however it runs to-day. It is also peculiar for the small amount of ash contained in the coal on which account it is so highly prized in the market.

The third vein to attain minable height is known as the Coal Run Cannel. This seam has been mined for ten or twelve years at Coal Run south of Wellston and for a longer period at South Webster and other points on the Portsmouth branch of the B. & O. S. W. Ry. As a cannel, its area is quite limited; the cannel being gradually replaced by the ordinary bituminous variety. Along the Portsmouth Branch the cannel is generally less than 200 yards in width; but such is still the excellence of the vein after it assumes the bituminous quality that although it is less than eighteen inches in thickness it is in such demand that it is mined for local use in preference to overlying beds four feet in thickness. It is thicker at Coal Run than at South Webster. After the exhaustion of the Wellston basin it will, notwithstanding it does not exceed two feet in thickness, be sought for and mined for distant markets.

The fourth seam of Jackson County is known as the limestone vein; it lies 400 feet above the Jackson shaft coal; 265 feet above the Wellston coal; and 65 feet above the Coal Run cannel. It is overlain by a bed of lime rock known as the "Grey lime stone" of the Hanging Rock region, which forms so marked a feature in the geology of Southern Ohio and Eastern Kentucky. Immediately overlying the limestone is the band of iron ore called the limestone ore, which for sixty years formed the basin of the charcoal iron industry of the Hanging Rock region. The limestone coal is from four to five feet in height including two partings of shale, the lower parting being one to two inches and the upper one being six to eight inches in thickness. This is a very persistent seam of coal, but it has never been mined with much vigor to date. It is opened in numerous places in the county for local consumption and has been shipped to Portsmouth and other points, but it has been so overshadowed by the Wellston vein that until the near exhaustion of that seam it will not cut a heavy figure in the market. It is a splendid steam coal and lasts well in grates; better than any coal of the slate

series and is destined to be the basis of a great coal trade. It will become the successor of the Wellston coal, and when drawn from the better sections of the region will take high rank and find ready sale.

Ten to twenty feet above the grey limestone, the fifth workable vein of coal of the Jackson County series is met. There is the equivalent of the Tunnel coal near Ironton and the New Castle coal near the Hanging Rock region where it has been mined for forty years. In Jackson County this vein is from three to four feet thick including a thin parting of slate. It is generally quite high in sulphur, but is nevertheless fitted for many uses, rolling mill purposes and the generation of steam, etc. The rolling mills of Ironton have always used the coal of this vein to the exclusion of all other grades. It has the sandstone roof and is known in consequence as the "Sand Roof Coal." A sandstone roof is generally the dread of the practical mining engineer, for it forebodes horsebacks and inferior coal. In the district which includes this seam, however the coal is remarkably steady, hundreds of acres having been mined over without encountering a single horseback.

Forty feet above, more or less, the sixth seam occurs. This is No. 6 or the Nelsonville coal, the steadiest of all the State series of the lower coal measures. In Jackson County this vein is generally thin, seldom exceeding three feet of merchantable coal. On Little Raccoon Creek, however, in Gallia County, it is met as a double seam and has an aggregate thickness of seven feet; this includes 15 to 18 inches of shale near the center of the vein, and part of the top coal also is "bone," which will have to be assorted out in shipping to market.

This vein shows a tendency to split up the intercolated shale, this running to eight and ten feet, leaving only three feet or less of marketable coal. The upper bench seems to thin out altogether to the west of Little Raccoon. On Symmis Creek it is met four feet thick with a shale fire-clay parting of four inches a little above the middle of the vein, and in this condition it can be followed to the Ohio river, where at the Sheridan mines it was worked extensively twenty years ago and shipped down the river in competition with the Pittsburgh and Pomeroy coals. It was also some years ago used for smelting iron at the Charcoal Furnace of the Washington Furnace Co. with good results.

Fifty to ninety feet above the No. 6, the No. 7, coal appears. This vein is met with in basins not unlike the basins in which the lower coal rests. It is sometimes five feet thick, but recedes rapidly and often disappears altogether over vast areas where it is due. This is the equivalent of the Bailey's Run coal of the

Hocking Valley and the Waterloo coal of Lawrence and Gallia counties. In Jackson County there is little of it met; its best development being in the high ridge which divides the water of Little and Big Raccoon creeks near the southern boundary of the county where it is known as the Lucas coal.

All veins too thin for mining have not been noticed in this paper. They are very numerous and occasionally swell up to two and one-half or three feet. Some of them appear to be in greater thickness in Vinton County, and will some day be eagerly mined. If all the seams of the series were counted there would be found at least twenty-five coal horizons, none of them either as large or small beds are spread over all the ground where they are due, and it is seldom that more than two seams are met directly above each other thick enough to mine. In their progress eastward one after another of the series of workable veins either thin out altogether or become so greatly reduced in thickness as to unfit them for mining purposes. Only at a few points in the County are the Jackson and Wellston coals found in the same hill where both seams are thick enough to work, and similar conditions exist with respect to the overlying beds.

The main seam of the County is the Wellston coal, not by reason of its extent but because of its quality. It is a tender coal and will not bear handling well; this is its one defect. In all other respects it has no superior if it has an equal in the whole range of the great Appalachian basin. But unless other basins are soon discovered its glory will not be of long duration. By the beginning of the 20th century, less than eight years distant, the output from the mines of this field will reach close upon 3,000,000 tons, and as the whole field in the beginning did not hold more than 75,000,000 tons, the first quarter of the 20th century shall not have passed away before the last ton of Wellston coal shall have become exhausted.

The people who are acquainted in Jackson County are aware as we all are who know how the strata lie, that the lower coals come to the surface on the west and the upper ones are only found in the eastern parts of the County, and after they are first met in the hills they are met in all the hills until they go under the water, what becomes of them after that we don't know. They never have been bored for, but there is a view on the geology of the great coal field that Prof. Orton, whom we all regret cannot be with us to-night, has often illustrated here or has often spoken of, and that is that as they get well under cover they thin out and disappear, and the theory is that the coal beds of the State were tip top on the edge of a basin, and that none of them exceeded a few miles in width. This is a view that I for one however

think is not true, and have never believed in it. There is no question but a great deal of barren ground exists east of where the coal goes under cover. Now this limestone basin that I spoke of I gave greater attention than I have any other, because a company has been organized to mine it and they have gone to shipping coal. It is sometimes 5, sometimes $4\frac{1}{2}$, and sometimes 4, and it will yield $3\frac{1}{2}$ after the shale is taken out. It retains fire remarkably. You can build a fire to-night and it will be in 24 hours without being touched. I never saw anything in the State and hardly any place else like it. I am very sorry now that we have not got our friend, Prof. Orton, to illustrate this, but it has occurred to me that the condition of this coal might prove its existence on the other side of the basin in West Virginia. I have been in the 12 poll region of West Virginia for the last 12 months, and I find coal there that retains fire just as this does. This is as I say might be same coal. I read a paper last January here on the coal seams of the 12 poll region, and tried to identify them with the coal seams of the Hanging Rock region of Ohio on the Ohio side, and then I supposed that vein the same vein as this limestone vein. (Applause.)

THE CHAIR: Gentlemen, you have heard a very able paper read by Mr. Roy. Is there any discussion to be had on the paper or any questions asked by any one present.

PROF. SPEAR: I should like to ask Mr. Roy if he finds the same conglomerate in West Virginia as in Ohio.

MR. ROY: Yes sir. I find the conglomerate if I have located it right. I have never read anything that the geologists of West Virginia have written on the subject, but the conglomerate is all through that region.

SECRETARY HASELTINE: I would like to ask Mr. Roy a question. He speaks of a new mine recently organized to mine one of these upper veins of coal. I would like for information to know what company it is and where they are located?

MR. ROY: It is called the Riverton Coal Company. Their mine is located at the old Buckeye furnace, and the President's name is Reese Thomas. His post-office address is Wellston, I think.

A MEMBER: Jordan.

THE CHAIR: If there are no more questions or any more discussion we will go on with the programme.

CAPT. MORRIS: I move we extend a vote of thanks to Hon. Andrew Roy for that valuable paper.

SECRETARY HASELTINE: I second the motion.

The question then coming upon the motion of Capt. Morris it is carried unanimously.

THE CHAIR: Now I presume for the reason that Mr. Haughee is here that his turn will come next and Prof. Lord will leave his paper until to-morrow, and I might say that the paper that is going to be read by Mr. Haughee is one that will or at least ought to arouse some discussion. It is something on the practical part of mining, "The Necessity of Making Breakthroughs Even and Uniform at the Mines," by Mr. Jas. W. Haughee of Nelsonville, O.